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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,506	11/13/2001	Brian T. Rosenberger	TA-00448	6463

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EXAMINER	
AMARI, ALESSANDRO V	

ART UNIT	PAPER NUMBER
2872	

NOTIFICATION DATE	DELIVERY MODE
05/02/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@bgllp.com

Office Action Summary	Application No.	Applicant(s)	
	10/010,506	ROSENBERGER ET AL.	
	Examiner	Art Unit	
	ALESSANDRO AMARI	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3 and 7-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3 and 7-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 25 February 2008 has been entered.

Claim Objections

2. Claim 26 is objected to because of the following informalities:

Regarding claim 26, the abbreviation "psia" should be spelled out.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3, 10, 11 and 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Deutsch et al US 4,340,617.

In regard to claim 1, Deutsch et al discloses (see Figure 1) an apparatus for forming a three-dimensional structure from a gaseous medium, comprising a processing chamber (14) to contain the gaseous medium (18); and a holographic projector to project at least one hologram into the gaseous medium within the processing chamber as described in column 11, lines 31-40, wherein the hologram imparts energy to dissociate gas precursors within the gaseous medium causing dissociated gas precursors to deposit in a pattern corresponding to the at least one hologram to thereby form the three-dimensional structure as described in column 4, lines 55-68 and column 5, lines 1-34.

Regarding claim 3, Deutsch et al discloses that the gas precursors within the medium are gaseous organometallic compounds as described in column 5, lines 10-14.

Regarding claim 10, Deutsch et al discloses that the energy to dissociate gas precursors corresponds to a wavelength of electromagnetic energy used to project the at least one hologram as described in column 5, lines 5-24.

Regarding claim 11, Deutsch et al discloses that the energy to dissociate gas precursors corresponds to absorption bands of the gas precursors as described in column 5, lines 5-10.

Regarding claim 13, Deutsch et al discloses wherein an intensity of the at least one hologram is manipulated to manipulate a deposition rate of the dissociated gas precursors as described in column 5, lines 21-29.

Regarding claim 14, Deutsch et al discloses that the gaseous organometallic compounds allow metal to be deposited in the pattern corresponding to the at least one hologram as described in column 5, lines 5-20.

Regarding claim 15, Deutsch et al discloses (see Figure 1) that the at least one hologram is projected onto a stage (16) within the processing chamber.

Regarding claim 16, Deutsch et al discloses (see Fig. 3) that the stage is thermally biased as described in column 10, lines 50-54.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deutsch et al US 4,340,617 in view of Marcus US 5,017,317.

In regard to claim 7, Deutsch et al teaches (see Figure 1) an apparatus to deposit a three-dimensional structure comprising a holographic projector to project a series of holograms as described in column 11, lines 31-40, a gaseous delivery system (19) to deliver gas precursors; and a processing chamber (14) wherein the processing chamber further comprises a window (19a) wherein the window is transparent to the holograms as described in column 5, lines 38-39, a plane (16) on which the holograms are imaged; an inlet (see opening in chamber 14 from tube connected to gaseous delivery system

19) to receive the gas precursors from the gaseous delivery system, wherein the hologram imparts energy to dissociate the gas precursors causing dissociated gas precursors to deposit in the plane in a pattern corresponding to the hologram as described in column 4, lines 55-68 and column 5, lines 1-34.

However, in regard to claim 7, Deutsch et al does not teach an outlet to exhaust effluent from the processing chamber.

In regard to claim 7, Marcus teaches (see Fig. 1) an outlet (25) to exhaust effluent from the processing chamber.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the exhaust outlet as taught by Marcus in the apparatus of Deutsch et al in order to achieve better control of the deposition process in the chamber thus forming a more precise three dimensional structure.

7. Claims 9, 12, 18-24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deutsch et al US 4,340,617 in view of Maxwell et al US 5,786,023.

In regard to claim 9, Deutsch et al teaches (see Figure 1) a method for forming a three-dimensional solid structure, the method comprising establishing a process environment (14) and imaging a first hologram within the process environment as described in column 11, lines 31-40 wherein the hologram imparts energy to the gas precursors, causing the gas precursors to dissociate wherein dissociated solids from the gas precursors form a first solid layer corresponding to the hologram as described in column 4, lines 55-68 and column 5, lines 1-34; and imaging a subsequent hologram within the process environment, wherein the subsequent hologram energy to the gas

precursors, causing the gas precursors to dissociate, wherein dissociated solids from the gas precursors form a subsequent solid layer corresponding to the subsequent hologram, wherein the subsequent solid layer is joined to the first solid layer thereby forming a three-dimensional structure as described in column 10, lines 50-68 and column 11, lines 1-42.

However, in regard to claims 9, 12 and 20, while Deutsch et al teaches the invention as set forth above, it does not teach a process environment having a controllable pressure, temperature and atmospheric composition.

In regard to claims 9, 12 and 20, Maxwell et al teaches (see Figure 1) a process environment having a controllable pressure, temperature and atmospheric composition as described in column 5, lines 54-67, column 6, lines 1-67 and column 7, lines 1-42.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the process environment of Maxwell et al for the method for forming a three-dimensional structure as taught by Deutsch et al in order to change deposit composition so that differing materials may be deposited as needed to tailor a three-dimensional structure's function.

Regarding claim 18, Deutsch et al teaches that the energy to dissociate gas precursors corresponds to a wavelength of electromagnetic energy used to project the first hologram and subsequent hologram as described in column 5, lines 5-24.

Regarding claim 19, Deutsch et al discloses that the energy to dissociate gas precursors corresponds to absorption bands of the gas precursors as described in column 5, lines 5-10.

Regarding claim 21, Deutsch et al discloses wherein an intensity of the at least one hologram is manipulated to manipulate a deposition rate of the dissociated gas precursors as described in column 5, lines 21-29.

Regarding claim 22, Deutsch et al discloses that the gaseous organometallic compounds allow metal to be deposited in the pattern corresponding to the at least one hologram as described in column 5, lines 5-20.

Regarding claim 23, Deutsch et al discloses (see Figure 1) that the at least one hologram is projected onto a stage (16) within the processing chamber.

Regarding claim 24, Deutsch et al discloses (see Fig. 3) that the stage is thermally biased as described in column 10, lines 50-54.

Regarding claim 26, Deutsch et al in view of Maxwell et al discloses the invention as set forth above but does not teach that the gaseous medium pressure ranges from about 0 psia to about 100 psia. It would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the pressure, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to adjust the pressure range of the apparatus of Deutsch et al in view of Maxwell et al in order to optimize the behavior of the gaseous medium so as to form different three-dimensional structures. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deutsch et al US 4,340,617 in view of Marcus US 5,017,317 and further in view of Amako et al US 5,497,254.

Regarding claim 8, Deutsch et al in view of Marcus teaches the invention as set forth above but does not teach a laser light to generate a coherent collimated electromagnetic energy and a computer driven phase plate placed in the path of the coherent collimated electromagnetic energy to the hologram.

Regarding claim 8, Amako et al teaches (see Fig. 24) a laser light (2412) to generate a coherent collimated electromagnetic energy and a computer driven phase plate (2404) placed in the path of the coherent collimated electromagnetic energy to the hologram as described in column 16, lines 9-42.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the collimated electromagnetic energy and computer driven phase plate of Amako et al in the apparatus of Deutsch et al in view of Marcus in order to provide a programmable modulation optical device offering increased flexibility and control for producing three-dimensional structures of increasing complexity and variety.

9. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deutsch et al US 4,340,617 in view of Amako et al US 5,497,254.

Regarding claim 17, Deutsch et al teaches the invention as set forth above but does not teach that the holographic projector further comprises a computer driven phase plate illuminated by a laser source to generate the at least one hologram.

Regarding claim 17, Amako et al teaches (see Fig. 24) that the holographic projector further comprises a computer driven phase plate (2404) illuminated by a laser source (2412) to generate the at least one hologram as described in column 16, lines 9-42.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the computer driven phase plate of Amako et al in the apparatus of Deutsch et al in order to provide a programmable modulation optical device offering increased flexibility and control for producing three-dimensional structures of increasing complexity and variety.

10. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deutsch et al US 4,340,617 in view of Maxwell et al US 5,786,023 and further in view of Amako et al US 5,497,254.

Regarding claim 25, Deutsch et al in view of Maxwell et al teaches the invention as set forth above but does not teach that the holographic projector further comprises a computer driven phase plate illuminated by a laser source to generate the at least one hologram.

Regarding claim 25, Amako et al teaches (see Fig. 24) that the holographic projector further comprises a computer driven phase plate (2404) illuminated by a laser source (2412) to generate the at least one hologram as described in column 16, lines 9-42.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the computer driven phase plate of Amako et al in the

apparatus of Deutsch et al in view of Maxwell et al in order to provide a programmable modulation optical device offering increased flexibility and control for producing three-dimensional structures of increasing complexity and variety.

Response to Arguments

11. Applicant's arguments filed 25 February 2008 have been fully considered but they are not persuasive.

The Applicant argues that the prior art Deutsch et al only teaches a holographic forming apparatus to image a spatially disjoint pattern which is not a three-dimensional structure and therefore does not teach the formation of a three-dimensional structure as recited in amended claim 1.

In response to this argument, the Examiner would like to point out that Deutsch et al while teaching the imaging of a pattern then goes on to teach the production of three-dimensional structures using the holographic forming apparatus. Examiner directs the Applicants attention to column 11, lines 35-42, reproduced below:

> In other applications of the invention, holographic and-/or coherent interferometry pattern forming apparatus can replace the pattern forming assembly 12, 36 of FIG. 1 to image a (spatially disjoint) pattern onto a substrate surface "indirectly" using these well-known optical techniques. This allows, for example, for the generation of grating and other interferometric patterns on the substrate surface in an easy and reliable manner.

Therefore, the apparatus of Deutsch et al meets the limitation of forming a three-dimensional structure since Deutsch et al teaches the formation of gratings which are three-dimensional structures.

The Applicant further argues in regard to claim 7, that the prior art does not teach the formation of a three-dimensional structure.

In response to this argument, the Examiner refers to the reply above.

The Applicant further argues in regard to claims 9, 12 and 18-24 that the prior art does not teach a process environment having controllable pressure.

In response to this argument, the Examiner would like to point out that the Maxwell et al reference has numerous citations of a process environment having controllable pressure (see for example, the 2nd sentence of the abstract, and column 8, lines 15-41). Therefore, the prior art does meet the limitation of a process environment having controllable pressure or a gaseous medium pressure within the processing chamber being manipulated to manipulate a deposition rate.

The Applicant further argues that claim 8 is patentable over Deutsch et al. '617 and Marcus '317 for the same reasons as claim 7. Furthermore, the Applicant argues that since Amako et al. '254 was cited as teaching a laser light, it is not a proper reference to support a rejection of claim 8.

In response to this argument, the Examiner refers to the reply above in regard to claim 7. Also, Examiner is at a loss to understand the Applicant's assertion that Amako is not a proper reference for claim 8 since it teaches a laser light and therefore meets the claim limitation which requires a laser light source.

The Applicant further argues in regard to claims 17 and 25, that Amako et al was cited as teaching a phase plate and not other elements of claims 17 and 25.

In response to this argument, the Examiner would like to point out that both claims 17 and 25 recite a computer driven phase plate illuminated by a laser source and that the obviousness rejection of Deutsch et al in view of Maxwell and further in view of Amako et al meets this limitation as shown in Figure 24 and as described in column 16, lines 11-36 of Amako et al. Examiner would like to point out that there are no other elements cited in claims 17 and 25 and therefore, the prior art teaches each and every element as set forth in the claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALESSANDRO AMARI whose telephone number is (571)272-2306. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on (571) 272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ava
25 April 2008

/Alessandro Amari/
Primary Examiner, Art Unit 2872